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EXAMINER	
FAULK, DEVONA E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/728,541	BIZJAK ET AL.	
	Examiner	Art Unit	
	Devona E. Faulk	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 November 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 12/14/2006, with respect to the rejection(s) of claim(s) 1-34 under 102 (b), 102(e) and 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Karlow et al., Jubien and Armstrong

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4-6,9,24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4-6 recite "...wherein the at least one compander comprises a plurality of companders,...". The specification discloses in the abstract discloses that a central power estimator mixer may also be included for integration of a plurality of companders. Throughout the specification a plurality of companders are discloses but a compander that comprises a plurality of companders is not.

Claims 5 and 6 also recite ".. wherein at least one transform engine comprises a plurality of transform engines.. " Throughout the specification a plurality of transform

engines are discloses but a transform engine that comprises a plurality of transform engines s not.

Claims 9 and 24 recite "wherein the input signal preprocessor includes at least one of a group comprising input selection,, analog to digital conversion, bandsplit filtering and equalization". The specification discloses in Figure 41B and in pages 94-95 that the preprocessor is a signal mixer with input scaling. The signal selector is not part of the preprocessor (Figure 41B).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Karlow et al. (US 4,441,086).

Regarding claim 1, Karlow discloses a signal processing system (Figure 1) comprising

at least one user-set parameter for establishing user-determined system settings (manual input controls, column 2, lines 30-36),

at least one compander (loudness control circuitry; column 2, lines 30-36),

a system volume control for setting system gain (volume circuitry; column 2, lines 30-36), and

at least one transform engine responsive to the at least one user-set parameter for controlling operation of the compander and setting the system volume control (implicit; column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls).

Regarding claim 2, Karlow discloses wherein the user-set parameter includes at least one of user volume control level, user minimum output level, and source input dynamic range. All elements of claim 2 are comprehended by the rejection of claim 1.

Regarding claim 3, Karlow discloses wherein the at least one transform engine controls the operation of the compander by setting at least one of a group comprising kneepoints, attack and release parameters, gain calculation coefficients, and zero dB offset values. It is implicit that for a compander that kneepoints would be set.

Regarding claim 7, Karlow discloses further including an input signal preprocessor responsive to an input signal for supplying a processed input to the compander, and wherein the compander operates on the processed input to provide a compander output to the system volume control. The input preprocessor could be the FM tuner or AM tuner that receive RF signals form the antenna (column 2, lines 25-36).

Regarding claim 10, Karlow discloses further including an output signal processor responsive to an output of the system volume control for generating a system output (Figure 1).

Regarding claim 11, Karlow discloses wherein the system output is at least one of a group comprising single channel audio output, multi-channel audio output, equalized outputs, and multi-amplified outputs (Figure 1).

Regarding claim 16, Karlow discloses wherein the at least one user-set parameter comprises a user interface for establishing user-set operation, set-up and configuration commands (column 2, lines 25-40).

Regarding claim 17, Karlow discloses further including a calibrator/annunciator responsive to the user interface for implementing in the compander the user-determined system settings (implicit; column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 8,9,24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karlow et al. (US 4,441,086) in view of Tonella (US 5,883,963).

Regarding claim 8, Karlow discloses an input signal preprocessor. He fails to disclose that the input preprocessor includes an input level adjuster. Tonella discloses an input

preprocessor that includes an input level adjuster (user can adjust the volume of the input signal , using the input unit 150, figure 1; column 3, lines 5-10). It would have beenobvious to have in input preprocessor include an input level adjuster so that the user can have control over the volume level.

Regarding claims 9 and 24, Karlow discloses an input signal preprocessor . Karlow fails to disclose that the input preprocessor or input level adjuster includes at least one of a group comprising input selection, analog-to-digital conversion, bandsplit filtering and equalization. Tonella discloses an input preprocessor that includes an input level adjuster (user can adjust the volume of the input signal, using the input unit 150, figure 1; column 3, lines 5-10; reads on equalization). It would have bee obvious to have in input preprocessor include an input level adjuster so that the user can have control over the volume level.

8. Claims 12-15 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karlow et al. (US 4,441,086) in view of Nakano et al. (US 5,404,315).

Regarding claim 12, Karlow discloses volume control, loudness control and manual input controls. Karlow fails to discloses further including a statistics engine for monitoring at least one compander operating parameter and for generating a histogram in accordance with the monitored compander operating parameter. Nakano discloses an automatic gain control apparatus comprising a statistics engine which generates a histogram for the purpose of gain control (column 7, line 40-column 8, line 2). The use of histograms made it possible to invoke gain control at the processors own sampling

rate. It would have been obvious to use a statistics engine for the purpose of improving the performance of the companding through digital signal processing.

Regarding claim 13, Karlow as modified by Nakano discloses further including an input level adjuster responsive to an input signal, and wherein the statistics engine monitors at least one operating parameter of the input level adjuster. All elements of claim 13 are comprehended by the rejection of claim 12.

Regarding claim 14,Karlow as modified by Nakano discloses wherein the statistics engine further includes an analysis engine for analyzing the histogram and generating a control signal in accordance therewith, and wherein the compander is responsive thereto. All elements of claim 14 are comprehended by the rejection of claim 13.

Regarding claim 15, Karlow as modified by Nakano discloses wherein the statistics engine further includes an analysis engine for analyzing the histogram and generating a control signal in accordance therewith, and wherein the input level adjuster is responsive thereto. All elements of claim 15 are comprehended by the rejection of claim 14.

Regarding claim 34, Karlow as modified by Nakano discloses wherein the statistics engine further includes an analysis engine for analyzing the histogram and generating a control signal in accordance therewith, and wherein the transform engine is response thereto. All elements of claim 34 are comprehended by the rejection of claim 12.

Regarding claims 13-15 and 34, the benefits of statistical engines have been established and it would have been obvious to utilize them as recited in claims 13-15 for the purpose of improving the performance of companding through digital signal processing.

9. Claims 18-20,26,27,29,35-39, are rejected under 35 U.S.C. 103(a) as being unpatentable over Karlow et al. (US 4,441,086) in view of Jubien et al. (US 5,6,868,162).

Regarding claim 18, Karlow discloses that the audio processing circuitry may include noise reduction (column 2, lines 30-36).. Karlow fails to disclose a noise extractor responsive to the reference signal and an environmental input for generating a compensation input to the transform engine. Jubien discloses a noise extractor responsive to a reference signal and an environmental input for generating a compensation input to the transform engine (column 5, line 54-column 6, line 35; Figure 2). It would have been obvious to modify Karlow by including a noise extractor response to the reference signal and an environmental input for generating a compensation input to the transform engine in order to providing a better listening experience for the user.

Regarding claim 19, Karlow discloses a signal processing system (Figure 1) comprising

at least one compander (loudness control circuitry; column 2, lines 30-36),

a system volume control for setting system gain (volume circuitry; column 2, lines 30-36), and

an input signal preprocessor response to an input signal for supplying an input to the compander, and wherein the compander operates on the input to provide a compander output to the system volume control (AM/FM tuner reads on preprocessor, column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls),

at least one transform engine responsive to the at least one user-set parameter for controlling operation of the compander and setting the system volume control (implicit; column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls),

an output signal processor responsive to an output of the system volume control for generating a reference signal (power amps read on output signal processor , Figure 1).

Karlow also discloses that the audio processing circuitry may include noise reduction (column 2, lines 30-36).

Karlow fails to disclose a noise extractor responsive to the reference signal and an environmental input for generating a compensation input to the transform engine.

.Jubien discloses a noise extractor responsive to a reference signal and an environmental input for generating a compensation input to the transform engine (column 5, line 54-column 6, line 35; Figure 2).

It would have been obvious to modify Karlow by including a noise extractor response to the reference signal and an environmental input for generating a compensation input to the transform engine in order to providing a better listening experience for the user.

Claims 20 shares common features with claim 19. All elements of claim 20 are comprehended by the rejection of claim 19.

Regarding claim 21, Karlow as modified by Jubien discloses a plurality of output signal processors each receiving an input signal and generating an output reference signal and wherein the noise extractor is responsive to the plurality of output signals . Karlow discloses a plurality of output signal processors each receiving an input signal and generating an output reference signal and noise reduction circuitry. It would have been obvious to apply the noise reduction to all the channels in order to providing a better listening experience for the user.

All elements of claim 21 are comprehended by the rejection of claim 20.

Regarding claim 22, Karlow as modified by Jubien discloses further including a plurality of volume controls responsive to the compensation input (Karlow discloses column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls; column 2, lines 30-36). All elements of claim 22 are comprehended by the rejection of claim 21.

Regarding claim 26, Karlow as modified by Jubien discloses a user interface responsive to the input signal for establishing user-set operation, set-up and

configuration commands. (Karlow; column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls; Jubien discloses a noise extractor). All elements of claim 26 are comprehended by the rejection of claim 20.

Regarding claim 27, Karlow as modified by Jubien discloses further including a calibrator/annunciator responsive to the user interface for adjusting system settings Karlow; column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls; Jubien discloses a noise extractor). All elements of claim 27 are comprehended by the rejection of claim 26.

Regarding claim 28, Karlow as modified by Jubien discloses further including a calibrator/annunciator responsive to the noise extractor for adjusting operating parameters of the compander. (Karlow; column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls; Jubien discloses a noise extractor). All elements of claim 28 are comprehended by the rejection of claim 18.

Regarding claim 29, Karlow as modified by Jubien discloses further including a calibrator/annunciator responsive to a user interface for adjusting operating parameters of the compander. (Karlow; column 2, lines 30-36 discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control

circuitry, or more of which may be responsive to manual input controls). All elements of claim 29 are comprehended by the rejection of claim 18.

Regarding claims 35 and 38, Karlow as modified by Jubien discloses, wherein the noise extractor obtains a noise signal from the environmental input and wherein the compensation input is derived from the noise signal. All elements of claims 35 and 36 are comprehended by the rejection of claims 19 and 20.

Regarding claim 36, Karlow as modified by Jubien discloses wherein the noise signal is obtained by comparing the environmental input and the reference signal, the reference signal representing a desired signal generated by the system (Jubien; column 5, line 54-column 6, line 35). All elements of claim 36 are comprehended by the rejection of claim 35.

Regarding claims 37 and 39, Karlow as modified by Jubien discloses wherein the reference signal represents a desired system output signa1. All elements of claims 37 and 39 are comprehended by the rejection of claims 19 and 20.I.

(New) The signal processing system of claim 20, wherein the output reference signal represents a desired system output.

10. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karlow et al. (US 4,441,086) in view of Jubien et al. (US 5,6,868,162) in further view of Tonella (US 5,883,963).

Regarding claim 23, Karlow as modified by Jubien discloses an input signal preprocessor. He fails to disclose that the input preprocessor includes an input level

adjuster. Tonella discloses an input preprocessor that includes an input level adjuster (user can adjust the volume of the input signal, using the input unit 150, figure 1; column 3, lines 5-10). It would have been obvious to have in input preprocessor include an input level adjuster responsive to the compensation input so that the user can have control over the volume level

11. Claims 25,30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karlow et al. (US 4,441,086) in view of Jubien et al. (US 5,6,868,162) in further view of Nakano et al. (US 5,404,315).

Regarding claim 25, Karlow as modified by Jubien discloses volume control, loudness control and manual input controls. Karlow as modified fails to discloses further including a statistics engine responsive to historical data for modifying system-operating parameters in accordance therewith. Nakano discloses an automatic gain control apparatus comprising a statistics engine which generates a histogram for the purpose of gain control (column 7, line 40-column 8, line 2). The use of histograms made it possible to invoke gain control at the processors own sampling rate. It would have been obvious to use a statistics engine for the purpose of improving the performance of the companding through digital signal processing.

Regarding claim 30,Karlow as modified by Nakano discloses further including a statistics engine responsive to the noise extractor for adjusting operating parameters of the compander.. All elements of claim 30 are comprehended by the rejection of claim 25.

12. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karlow et al. (US 4,441,086).

Regarding claims 31-33, Karlow discloses the audio processing circuitry may include noise reduction circuitry, tone, fade, volume and loudness control circuitry, or more of which may be responsive to manual input controls. Karlow does not explicitly discloses that the user ser parameter is a user minimum output level, a source input dynamic range, or two of a user minimum output level, a source input dynamic range or user volume control level. The examiner takes office notice that such parameters were well known in the art at the time of the invention to one of ordinary skill in the art and it would have been obvious to implement any combination of those parameters for the purpose of providing the best listening experience to the user.

13. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karlow et al. (US 4,441,086) in view of Armstrong et al. (US 5,832,097).

Regarding claim 4, Karlow discloses a compander (loudness control circuitry) and the compander being responsive to a transform engine (See Karlow as applied above to claim 1). Karlow fails to disclose that the compander comprises a plurality of companders. Armstrong discloses a compander (64 and 66 read on 1 compander) comprising a plurality of companders (Figure 4). It would have been obvious to modify Karlow to include a plurality of companders in order to provide companding for each channel in a multi-channel system.

Regarding claim 5, Karlow discloses a compander (loudness control circuitry) and the compander being responsive to a transform engine (See Karlow as applied above to claim 1). Karlow fails to disclose that the transform engine comprises a plurality of transform engines and that the compander comprises a plurality of companders. Armstrong discloses a compander (64 and 66 read on 1 compander) comprising a plurality of companders (Figure 4). It is obvious that a plurality of transform engines could be included if desired by the designer of the system. It would have been obvious to modify Karlow to include a plurality of companders in order to provide companding for each channel in a multi-channel system.

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karlow et al. (US 4,441,086) in view of Armstrong et al. (US 5,832,097) in further view of Yumoto et al. (US 6,195,438).

Regarding claim 6, Karlow as modified by Armstrong fails to disclose a central power estimator mixer responsive to the plurality of companders. Yumoto discloses a method comprising pre-process circuitry (22; Figure 3) which is a power estimator mixer. The estimation of power of the incoming signals is used for volume control in volume control unit 28. It would have been obvious to one of ordinary skill in the art to modify Karlow as modified by Armstrong to have power estimator mixer, at the outputs of the companders for keeping the output level consistent which would avoid high volume levels damaging the ears of the user.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 571-272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848.

The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2615. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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